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A NEW CYCAD FROM THE CAPE PROVINCE.*

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(With Plates I—III.)

Encephalartos arenarius *R. A. Dyer* sp. nov., affinis *E. latifrondi* Lehm. plantis minoribus foliolis laxioribus tenuioribus glabris differt.

Planta subacaulis vel usque 1 m. alta, e basi frequenter ramosa, truncis cylindricis usque 25 cm. diam. *Folia* 1—1·25 m. longa, juniora plus minusve glauca, circiter 30-juga; foliola mediana leviter imbricata, oblongo-lanceolata, 12—16 cm. longa, 2·5—4 cm. lata, acuta sessilia, basi 1—1·5 cm. lata, margine supra plano vel per rariter 1-lobato, margine infra lobis 3 rariter 4 subtriangularibus pungentibus armato, nervis parallelis satis tenuibus. *Strobilus femineus* 35—45 cm. longus, circiter 20 cm. latus, glaucus; facies squamarum 5 cm. latæ, 4 cm. altæ, 2 cm. prominentes, umbilico truncato 10—12 mm. lato, semina scarlatina, 5 cm. longa, 2—2·5 cm. diam. *Squamae strobili masculini* 3—3·5 cm. longae, 2·25—2·5 cm. latae, umbilico 1 cm. prominente.

CAPE PROVINCE. Alexandria Div., Kaba Valley, *Archibald* 5420, *Dyer* 5439, 5441 in Nat. Herb. Pretoria (type), 5443; cultivated at N.B.G., Kirstenbosch, *Henderson* 2017; Cape Town Municipal Garden, *Lewis*.

Stem simple or more often branched from the base into clumps, up to 1 m. long and at this stage usually reclinate. *Leaves* 90—125 cm. long, usually somewhat glaucous when young, apex generally recurved; petiole 15—20 cm. pulvinus 3—4 cm. broad, with brown wool; leaflets in about 30 pairs on mature plants, sometimes remaining slightly glaucous, flat or somewhat twisted, pungent, reduced in size towards apex and to petiole to one prickle, those in lower half more spaced and spreading and less lobed, those in the upper half closer and forming a V; medium ones 12—16 cm. long, 2·5—4 cm. broad, 1—1·5 cm. broad at attachment, closely veined on lower surface; upper margin entire or only very rarely with a tooth; lower margin usually 3-, rarely 4-lobed, reduced to 2—1 on lower leaflets; the lobes in the same plane as the body of the leaflet or only slightly twisted, pungent; leaflets of seedlings deeply tridentate or trilobed at the apex with or without an extra tooth on the upper margin and with 1—2 extra teeth or lobes on the lower margin. *Female cone* solitary, with stout peduncle 4—8 cm. long, mainly oblong and narrowed abruptly to apex, 35—45 cm. long, about 20 cm. broad, more or less glaucous; median scales with exposed face mainly 4-sided with occasionally the top and bottom angles blunted, 5 cm. broad, 4 cm. high, protruding about 2 cm., slightly ridged from the angles to the central umbilicus and with lesser irregular ridges between, otherwise smooth and not tuberculate, with or without extremely minute papillae; umbilicus slightly concave, 10—12 mm. diam.; surface smooth; stipe pale yellow, angled, 4—5 cm. long, with sinus arms up to about 2 cm. long; seed coral-red, up to about 5 cm. long, 2—2·5 cm. broad. *Male cone* not seen intact, apparently smaller than female; median scales 3—3·5 cm. long, 2·25—2·5 cm. broad, beak projecting 1 cm. beyond sporangial surface, with its face 7—10 mm. broad, slightly angled, nearly flat, glabrous.

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In 1852 Karl Zeyher[1] compiled a note on *Encephalartos* species of the eastern Cape in which he referred to *E. altensteinii* being near the Bushman's River not far from Olifantshoek and "*E. tridentatus* also, but sparingly, in that neighbourhood". It is evident that the name *E. tridentatus* is not correctly applied and one can only guess that Zeyher had in mind a plant related or idential to the species described above. There is, however, a bewildering collection of living plants, some with tridentate leaflets, in the Alexandria division on the right bank of the Bushman River and only a specimen could prove exactly what Zeyher referred to. Apparently he left no such record.

Relatively little further field work was done on the genus in the Cape until the building up of the living collection of *Encephalartos* at the National Botanic Gardens, Kirstenbosch, early in this century. But even when Hutchinson and Rattray[2] monographed the Cycadaceae for the Flora Capensis in 1933, the present species was not recognised. In 1945, however, Henderson[3] drew attention to the distinctiveness of the plant (Henderson 2017) in cultivation at Kirstenbosch and a specimen *Tidmarsh* s.n. which Hutchinson and Rattray had identified as *E. latifrons* without citing it.

In 1953 Dr. E. E. A. Gledhill reported the discovery of a colony of unidentified *Encephalartos* on the inland sanddunes of Alexandria in the Kaba Valley. An inspection was carried out with her in 1954, which eventually led to the correlation of the above cited records. Specimens of *E. arenarius* were reported by the owners of the farms to be fairly widely distributed in the scrub bush and it was also stated that a large number had been removed for cultivation within recent times. The habitat in coastal bush on stabilised sand-dunes is strongly reminiscent of the conditions under which *E. ferox* (= *E. kosiensis*) grows in its native haunts in Portuguese East Africa and Zululand.

The closest affinity of *E. arenarius* is certainly with *E. latifrons* and it might not always be possible to distinguish detached leaves or leaflets of each. On the other hand in the presence of full records there should be no doubt. *E. latifrons* produces robust erect trunks up to 6 feet and more tall, the leaves are rigidly curved, the leaflets are finely pubescent when young, densely overlapping and strongly veined below; female cones are large with the scales coarsely papillate and scaly pubescent on the surface. In *E. arenarius* the plants are less robust, the decumbent erect stems rarely attain a length above the ground of 3 feet, the leaves are comparatively long, the leaflets are glabrous and moderately densely spaced, the female cones are smaller, the surface of the scales is slightly wrinkled, glabrous and glaucous. The Kaba Valley population of *E. arenarius*, judging from an inspection of up to 100 specimens in all stages of maturity, is uniform. No other species is known from the immediate vicinity and there is no indication of hybridisation.

To return to the subject of the variation among specimens on the banks of the Bushman's River, that locality has been investigated by several botanists, including Miss I. C. Verdoorn in 1947. Typical *E. altensteinii* is the only recognised species so far found in the immediate vicinity and, amongst the nondescript population, similarities were noted with it and *E. lehmannii* Lehm. forma, *E. horridus* Lehm. and *E. arenarius* which are known from within some miles' radius.

Two suggestions to explain the different combinations of characters have been put forward; (*a*) that the specimens constitute unstable parent stock from which one or more of the species referred to have evolved by processes of segregation and isolation and (*b*) that the variations are the result of hybridisation between specifically distinct groups. I am of the opinion that some at least of the specimens seen on the right bank of Bushmans River, about 2 miles from the mouth, are the result of hybridisation. On the other hand the variable stock of *E. lehmannii* in the Fish River Valley further east may well have been the source of *E. horridus* and *E. lehmannii* as segregated out near Uitenhage and Steytlerville, respectively.

The field work within recent years has brought to light many interesting facts but has not made the taxonomist's task easier, as, theoretically, it should have done. We are confronted by more problems than ever before of a similar nature to those referred to above.

REFERENCES.

1. ZEYHER: Per President: Phytol. 4 (1852), 613.
2. HUTCHINSON AND RATTRAY: Flora Capensis, 5 Sect. 2 suppl. (1933), 24-44.
3. HENDERSON, M. R.: Journ. S.A. Bot., 11 (1945), 26.

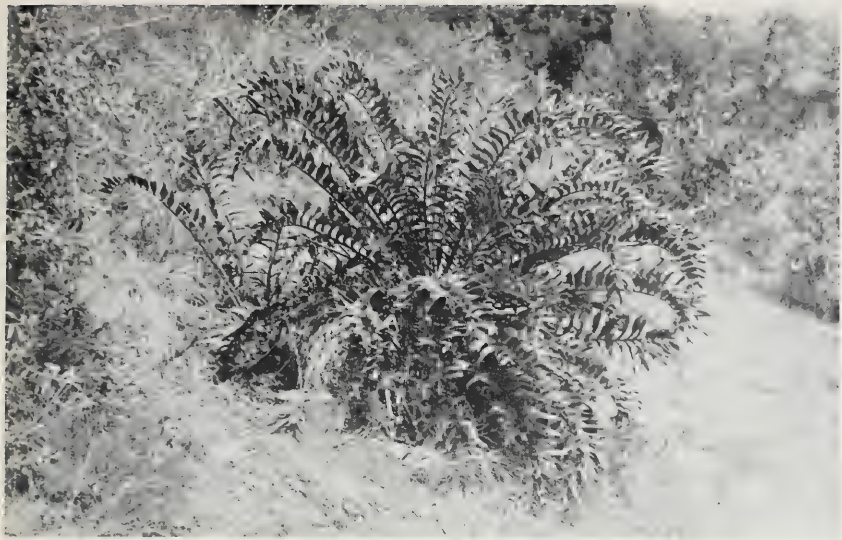

Plate I. Encephalartos arenarius.
Cape Province, Alexandria Division, Kaba Valley, 5 miles inland from Woody Cape, F. Muller's farm. Northern facing. Photo R. A. Dyer, 232/2. 23 February, 1954. = specimen No. 5439. = Gledhill 5420.

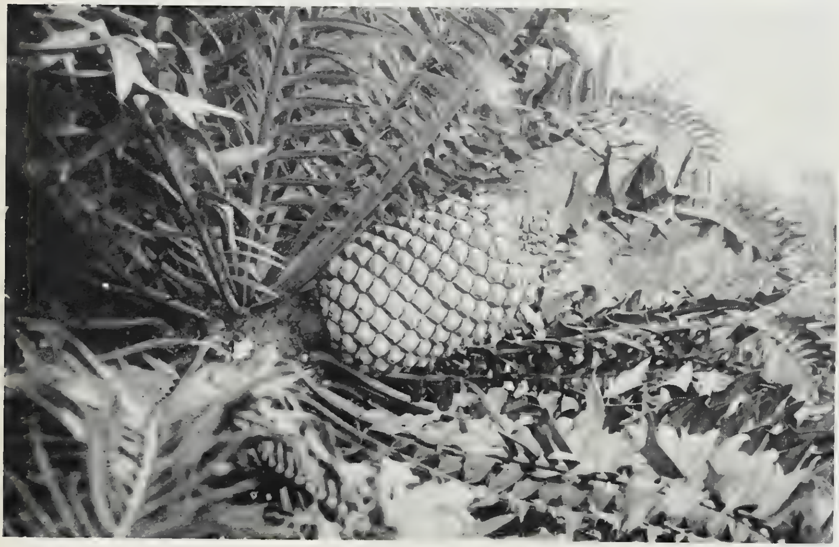

Plate II. Encephalartos arenarius.
Cape Province, Alexandria Division. Kaba Valley, 4 miles inland from Woody Cape on "Old" Muller's farm, eastern facing (cone glaucous). Photo R. A. Dyer 233/2. = Specimen No. 5441a♀. 23 February, 1954.

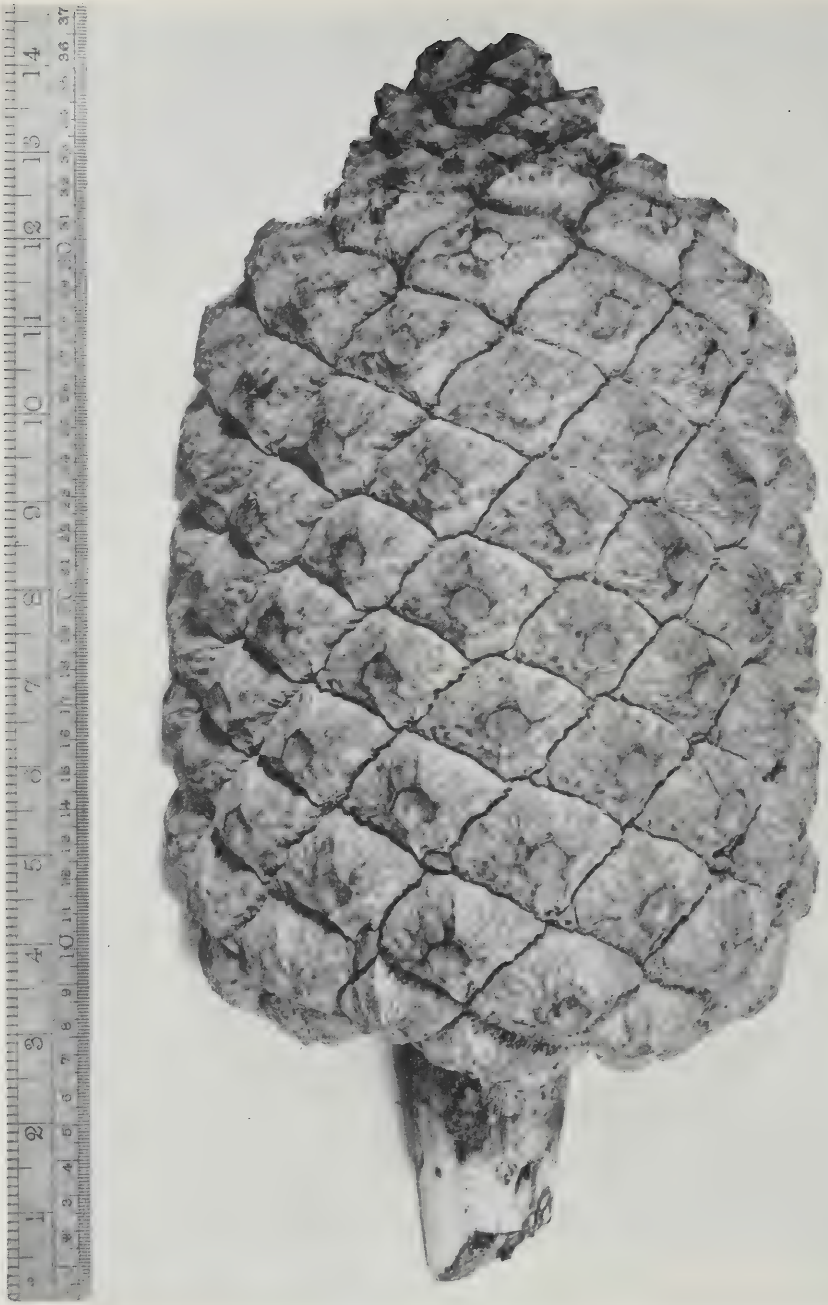

Plate III. Encephalartos arenarius.

Alexandria Division, Cape Province. About 5 miles from coast, steep slope facing north-east on margin of bush clumps, cone glaucous, leaflets green, not very rigid. E. E. A. Gledhill 5420 (Archibald). Dec., 1953. Photo H. King.